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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,578	08/12/2002	Johannes Borsboom	VER-157XX	2516

207 7590 07/29/2003

WEINGARTEN, SCHURGIN, GAGNEBIN & LEOVICI LLP
TEN POST OFFICE SQUARE
BOSTON, MA 02109

EXAMINER

VANOY, TIMOTHY C

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 07/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10-089,578

Applicant(s)

BORSBOOM et al.

Examiner

VAN OY

Group Art Unit

1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on

THE PRELIMINARY AMEND'T. DATE-STAMPED 29 Mar. 2002.

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-25 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-25 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☒ All ☐ Some* ☐ None of the:

☒ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper N (s). _____

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

Office Action Summary

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as their invention.

- a) Claim 1 does not particularly point out and distinctly set forth what the sulfur dioxide is reduced into (i. e. is the sulfur dioxide reduced into hydrogen sulfide or elemental sulfur?).
- b) Regarding claim 1, the phrase "more in particular" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).
- c) Regarding claims 1, 7, 13-17 and 24, the phrase "preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Art Unit: 1754

d) Regarding claims 6 and 10-12, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

e) In claim 3, the use of designators Group VIB and Group VIIB renders these claims vague and indefinite because different periodic tables of elements use the same group designator for different chemical groups. For example, a group VIB element in one periodic table may be a group VIA element in another periodic table. It is suggested to recite the actual elements, rather than Group VIB, Group VIIB and Group VIII.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1754

The person having "ordinary skill in the art" has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 3,947,547 in view of pgs. 421 and 422 in the Gas Purification text (4th ed.) by Kohl et al.

U. S. Pat. 3,947,547 describes a process for obtaining elemental sulfur from a sulfur compound-containing gas, comprising the steps:

Subjecting a hydrogen sulfide-containing gas to partial oxidation, so that a portion of the hydrogen sulfide is converted into sulfur dioxide;

Subjecting the mixture of hydrogen sulfide and sulfur dioxide to a Claus catalyst to provide a gas comprising elemental sulfur, water and residual hydrogen sulfide and sulfur dioxide (please see col. 1 Ins. 8-33 in U. S. Pat. 3,947,547);

Mixing the resulting sulfur dioxide and water-containing gas with hydrogen and passing this mixture over a catalyst, such as cobalt and/or nickel and/or iron in sulfided form, supported on a support, such as silica (please see col. 2 Ins. 58-64 and col. 5 Ins. 7-25 in U. S. Pat. 3,947,547) at a temperature above 175 °C and a gas hourly space velocity of 500 to 10,000 NI of Claus off-gas per liter of catalyst per hour (please see col. 5 Ins. 2-6 in U. S. Pat. 3,947,547) so that the hydrogen reduces the sulfur dioxide into hydrogen sulfide, and

Passing the resulting hydrogen sulfide-containing gas through an oxidizing solution, which promotes the oxidation of the hydrogen sulfide into elemental sulfur (please also see col. 5 Ins. 31-33 and Ins. 54-58 in U. S. Pat. 3,947,547), as set forth in applicants' claims 1-25.

The difference between the applicants' claims and U. S. Pat. 3,947,547 is that applicants' claims 1 and 9 call for the oxidation of the hydrogen sulfide into elemental sulfur to occur over a dry bed (whereas the process of U. S. Pat. 3,947,547 uses solutions to promote the oxidation of the hydrogen sulfide into elemental sulfur).

Pgs. 420-428 in the Gas Purification text (4th ed.) discloses that a dry box of iron sulfide can be used to remove hydrogen sulfide out of a gas via reaction between the iron oxide and the hydrogen sulfide to form iron sulfide, and then passing oxygen through the iron sulfide to oxidize it back to iron oxide with the concomitant production of elemental sulfur (please see pg. 421, 1st and 2nd full paragraphs in the Gas Purification text). The paragraph bridging pgs. 421 and 422 and the 1st full paragraph on pg. 422 in the Gas Purification text reports that advantages of the dry iron oxide

Art Unit: 1754

process include complete removal of hydrogen sulfide; low pressure drops and the avoidance of the reaction between impurities in the gases being treated with certain chemicals present in liquid purification processes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process described in U. S. Pat. 3,947,547 *by substituting* the dry iron oxide process described on pg. 421 in the Gas Purification text *in lieu of* the wet oxidation process mentioned in col. 5 Ins. 54-58 in U. S. Pat. 3,947,547, in the manner required by at least applicants' claims 1 and 9, *because* of the taught advantage of avoiding the reaction between impurities present in the gases being treated and certain chemicals present in the liquids used in wet oxidation processes (which are submitted to include the wet oxidation process set forth in col. 5 Ins. 54-58 in U. S. Pat. 3,947,547).

The difference between the applicants' claims and U. S. Pat. 3,947,547 is that applicants' claim 1 reports that the feed gas contains at least 10 volume percent of water, however it is submitted that this same feed gas emitted from the same Claus process will inherently contain this same amount of water – hence, this difference really is not a difference at all and is submitted to inherently occur in the process of U. S. Pat. 3,947,547.

The difference between the applicants' claims and U. S. Pat. 3,947,547 is that applicants' claim 1 sets forth that the mole ratio of reducing agent (i. e. hydrogen) to the sulfur dioxide ranges from more than 10 to up to 100, *however* it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the

Art Unit: 1754

invention was made *because* such surplus of reducing agent is an obvious means of insuring that all of the sulfur dioxide was reduced.

The following references, which are indicative of the state of the art, are made of record:

U. S. Pat. 5,948,382 disclosing a process for the selective oxidation of hydrogen sulfide into elemental sulfur using a mixed oxide catalyst, and

U. S. Pat. 4,511,668 disclosing a catalyst for the hydrolysis of carbonyl sulfide.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 703-308-2540. The examiner can normally be reached on 8 hr. days.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

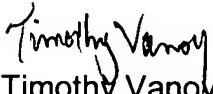
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Application/Control Number: 10/089,578

Page 8

Art Unit: 1754

Timothy Vanoy/tv
July 22, 2003


Timothy Vanoy
Patent Examiner

Art Unit 1754